

The invention claimed is:

1. A method for doping silica soot with fluorine during laydown, comprising the steps of:
- 5 providing a bait rod;
- providing a burner, the burner emitting a reactant flame;
- providing at least one first gas-feed separated from the burner, the gas-feed supplying a first jet of fluorine based gases;
- 10 depositing a layer of silica soot on the bait rod by vaporizing a silica producing gas within the reactant flame of the burner; and
- supplying the first jet of fluorine-based gases to the silica soot deposited onto the bait rod via the first gas-feed subsequent to vaporizing at least a portion of the silica producing gas within the reactant flame of the burner.
- 15 2. The method of claim 1, wherein the first jet of fluorine supplying step includes directing the first jet of fluorine-based gases such that the first jet of fluorine-based gases does not contact the silica soot prior to the silica soot being deposited onto the bait rod.
- 20 3. The method of claim 2, wherein the first jet of fluorine is directed substantially orthogonal to the bait rod.
4. The method of claim 3, and further including:
- providing at least one second gas feed juxtaposed across the burner from the
- 25 first gas-feed, the second gas-feed supplying a second jet of fluorine-based gases; and
- supplying the second jet of fluorine-based gases to the silica soot deposited onto the bait rod via the second gas-feed subsequent to vaporizing at least a portion of the silica producing gas within the reactant flame of the burner.
- 30 5. The method of claim 4, wherein the second jet of fluorine supplying step includes directing the second jet of fluorine-based gases such that the second jet of

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fluorine-based gases does not contact the silica soot prior to the silica soot being deposited onto the bait rod.

6. The method of claim 5, wherein the fluorine-based gases include SF_6 .

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7. The method of claim 1, wherein the fluorine supplying step includes directing the first jet of fluorine-based gases such that the first jet of fluorine-based gases contacts the silica soot prior to the silica soot contacting the bait rod.

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8. The method of claim 7, and further including:
 providing at least one second gas-feed juxtaposed across the burner from the first gas-feed, the second gas-feed supplying a jet of fluorine-based gases; and
 supplying the second jet of fluorine-based gases to the silica soot deposited onto the bait rod via the gas-feed subsequent to vaporizing at least a portion of the silica producing gas within the reactant flame of the burner.

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9. The method of claim 8, wherein the second jet of fluorine supplying step includes directing the second jet of fluorine-based gases such that the second jet of fluorine-based gases contacts the silica soot prior to the silica soot contacting the bait rod.

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10. The method of claim 9, wherein the fluorine-based gases include SF_6 .

11. The method of claim 1, and further including:

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providing at least one second gas feed juxtaposed across the burner from the first gas-feed, the second gas-feed supplying a second jet of fluorine-based gases; and
 supplying the second jet of fluorine-based gases to the silica soot deposited onto the bait rod via the second gas-feed subsequent to vaporizing at least a portion of the silica producing gas within the reactant flame of the burner.

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12. The method of claim 1, wherein the fluorine-based gases include SF_6 .

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13. The method of claim 1, wherein the reactant flame is produced from a compound containing hydrogen.

14. An apparatus for doping silica soot with fluorine during the formation of an optical fiber, comprising:
a burner adapted to emit a reactant flame to vaporize a silica producing gas; and
at least one first gas-feed separated from the burner, the gas-feed adapted to supply a first jet of fluorine-based gases; and
wherein the reactant flame emitted from the burner is used to vaporize the silica producing gas thereby creating a silica soot which is deposited on a bait rod, and
wherein the first gas-feed is oriented such that the first jet of fluorine-based gases contact the silica soot subsequent to at least a portion of the silica producing gas being vaporized within the reactant flame of the burner.

15. The apparatus of claim 14, wherein the first gas-feed is oriented such that the first jet of fluorine-based gases does not contact the silica soot prior to the silica soot being deposited on the bait rod.

16. The apparatus of claim 15, wherein the first gas-feed is oriented such that the first jet of fluorine is directed substantially orthogonal to the bait road.

17. The apparatus of claim 16, further including:
at least one second gas-feed juxtaposed across the burner from the first gas-feed, the second gas feed adapted to supply a second jet of fluorine-based gases; and
wherein the second gas-feed is oriented such that the second jet of fluorine-based gases contact the silica soot subsequent to at least a portion of the silica producing gas being vaporized within the reactant flame of the burner.

18. The apparatus of claim 14, wherein the first gas-feed is oriented such that the second jet of fluorine-based gases contacts the silica soot prior to the silica soot being deposited on the bait rod.

at least one second gas-feed juxtaposed across the burner from the first gas-feed, the second-gas feed adapted to supply a second jet of fluorine-based gases; and

wherein the second gas-feed is oriented such that the second jet of fluorine-

at least one second gas-feed juxtaposed across the burner from the first gas-feed, the second gas-feed adapted to supply a second jet of fluorine-based gases; and

wherein the second gas-feed is oriented such that the second jet of fluorine-

at least one second gas-feed juxtaposed across the burner from the first gas-feed, the second gas-feed adapted to supply a second jet of fluorine-based gases; and

wherein the second gas-feed is oriented such that the second jet of fluorine-

20 rod.